

WEATHER, FORECASTS, AND WARNINGS.

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Pressure was unusually low over the British Isles and the North Atlantic steamship routes during the month, but no unprecedented delays to trans-Atlantic shipping have been reported.

Honolulu.—Pressure for the month averaged about normal. Lows occurred on the 1st–4th, 8th–9th, 11th, 18th–19th, 23d, and 25th; and highs on the 5th–6th, 9th–10th, 13th–17th, 20th–21st, and on the last day of the month.

Alaska.—Pressure for the month averaged below normal. Lows occurred about the 1st–2d, 4th–5th, 7th–8th, 10th–11th, 14th, 16th–17th, 21st–22d, and 24th–25th; and highs about the 3d–4th, 6th, 9th, 12th, 19th, 23d–24th, and 27th.

Siberia.—Pressure was generally low for the month. It was almost continuously below normal from the 6th to 24th. The most important low of the month occurred about the 21st and the most important high about the 3d–4th. Lows occurred on the 1st–2d, 6th, 9th–10th, 12th–13th, 15th, 17th, 21st, 24th, and 27th–28th; and highs on the 3d–4th, 7th–8th, 13th–14th, 16th, 18th, 26th, and 29th.

Azores.—The month was marked by pressure decidedly below the seasonal average. The lowest pressure of the month occurred at 5 a. m., Greenwich time, of the 7th, 26.60 inches. Lows occurred on the 6th–7th, 9th, 14th–15th, 19th–20th, 21st–22d, 25th, 27th, and 29th; and highs on the 1st–2d, 8th, 12th, 18th, 24th, 26th, 28th, and last day of the month.

Iceland.—Lows occurred on the 4th–6th, 8th–9th, 10th–11th, 18th, and 26th; and highs on the 1st–3d, 7th, 13th–15th, 21st–22d and 28th.

In the United States, temperatures during the first half of the month were almost continuously below normal over the eastern sections of the country, the greatest deficiency being in the Ohio and Mississippi Valleys and the Lake region. To the west of the Rocky Mountains temperatures averaged slightly above normal. During the last half of the month moderate temperatures prevailed over all districts until near the end, when a cold wave was felt over the Northwest. In the West precipitation was deficient, especially over southern districts where the season was among the driest of record. In the East precipitation was also below normal except during the last decade of the month. The heaviest ice in years was reported around Nantucket, resulting in delays to shipping. On Lake Superior ice 26 inches thick was reported a mile from shore off Ashland, Wis., while near the shore line it was 40 inches in thickness.

At the beginning of the month, a low pressure area of moderate intensity was central over southern Lake Michigan, while another disturbance of marked energy was over the Canadian Maritime Provinces. West of the Mississippi River pressure was above normal, a high pressure area of considerable magnitude being located over the northern Plateau region. The Michigan low by the morning of the 2d had moved to a position east of Lake Huron and by the morning of the 3d had passed to the Canadian Maritime Provinces. Precipitation occurred in connection with this disturbance quite generally over northern districts east of the Mississippi River. Following its passage

frosts were reported in the east Gulf States to the coast, warnings of which were previously issued. On the morning of the 2d a low pressure area was central over eastern Colorado and by the morning of the 3d it had passed to Missouri with increased intensity. By the following morning it was off Nantucket, having caused precipitation in central districts from the Rocky to the Appalachian Mountains. Moderately heavy snows were reported in the Middle Mississippi and Ohio Valleys, causing considerable delay to railroad traffic. From Nantucket the storm passed northeastward over the Grand Banks. High winds occurred during the night of the 3d, on the east Gulf coast, warnings of which were issued the preceding afternoon. Storm warnings were ordered for the Atlantic coast from Savannah to Eastport the evening of the 3d, and gales occurred over that section during the next 36 hours, as indicated in the warnings.

The following weekly forecast was issued Sunday, February 4:

Unseasonably cold weather the first two days of the week in the Eastern and Southern States will be followed by a reaction to higher temperatures in these regions by the middle of the week. Over the Middle West, the Rocky Mountain region, and the Pacific slope temperatures during the week will average near or above the normal. There are no indications at the present time that another cold wave will cross the country during the coming week.

The weather during the week will be generally fair, except for a short period of snows and rains attending a disturbance that will appear in the Far West on Tuesday or Wednesday, cross the Middle West about Thursday and the Eastern States Friday or Saturday. Frequent rains are probable in the North Pacific States.

Stormy weather is likely to continue the coming week over the North Atlantic steamship routes and Europe.

The high pressure area that was central over the northern plateau at the beginning of the month remained stationary for 36 hours and by the morning of the 3d was over eastern Nebraska, with temperatures from 10° to 20° below zero near its center. One of the coldest days in 30 years was reported in parts of Wisconsin. By the morning of the 4th the disturbance was over the Plains States with two centers, one over western North Dakota and the other over Kansas. The northern center remained practically stationary for 24 hours, while the southern center passed to Texas, causing decided falls in temperature to 20° below the normal over the Gulf States, the Ohio Valley, and Atlantic States from central Florida to Pennsylvania by the morning of the 5th, warnings of which were previously issued. During the next two days the North Dakota high passed to Louisiana and by the morning of the 8th to Alabama. It caused heavy to killing frost along the Gulf coast and freezing temperature in central and northern Florida.

On the evening of the 6th a low appeared north of Lake Superior, and by the following morning it had advanced to eastern Ontario. By the morning of the 7th it had moved to Quebec, and during the next 24 hours it passed to the Canadian Maritime Provinces. It caused snows in the Lake region and in the New England States. On the morning of the 7th a high pressure area appeared over Alberta, accompanied by temperatures decidedly below normal, and by the following morning had advanced to the northern Plains States, causing decided falls in temperature over the districts from the northern slope

of the Rocky Mountains to the Lake region. On the morning of the 9th it was central over northeastern North Dakota with decreased intensity, and by the following morning was over Lake Erie. It moved slowly eastward with decreasing intensity, and on the morning of the 11th it was over Lake Ontario, and by the next morning it had apparently disappeared. This high caused cold weather for the season in middle and northern districts from the Missouri and Mississippi Valleys eastward, and some of the lowest temperatures of record occurred along the shores of Lakes Erie and Ontario and in northern New York. It caused frosts as far south as northern Florida. A storm that had apparently moved from the north Pacific Ocean was central on the morning of the 7th over Nevada. During the next 24 hours it advanced to the southern slope of the Rocky Mountains, having caused no precipitation of consequence thus far in its passage. From a position over Texas on the morning of the 9th it advanced to southern Alabama by the morning of the 10th. During the night of the 10th it passed east and northeastward off the coast and to the north of and probably near the island of Bermuda during the 11th. The barometric pressure reported at Hamilton on that island at 8 p. m. of the 11th was 29.52 inches, and the velocity of the wind 48 miles from the southwest. Precipitation in connection with this storm was confined to the Gulf and South Atlantic States with heavy falls of snow in portions of the South Atlantic States. On the morning of the 10th storm warnings were ordered for the south Atlantic coast and high winds occurred as forecast. This low was not accompanied by any decided changes to warmer weather. The following weekly forecast was issued Sunday, February 11:

The weather map of the Northern Hemisphere of this date shows a general change from the intense winter conditions that have prevailed almost continuously since the first of the year, and it is probable that moderate temperatures will prevail the coming week throughout the United States. There are no indications at the present time of a general storm to cross the country, and it is probable that the precipitation for the week will be generally light, except in the North Pacific States, where more than the normal rainfall will occur.

A period of rains set in on the North Pacific coast on the 7th and continued until the 11th. A disturbance that was over British Columbia on the morning of the 9th passed to the Plains States by the 10th, and by the morning of the 11th was over southeastern Iowa, having caused but little precipitation. By the morning of the 12th it was over West Virginia, and snows were reported in the Lake region, being heavy in portions of New York State. By the following morning the disturbance had apparently passed off the North Atlantic coast. Decided changes to warmer weather attended its passage. Following the passage of this storm a high pressure area of slight intensity appeared over western Ontario on the morning of the 11th, and by the following morning was over Lake Superior, whence it passed to Lake Huron by the morning of the 13th with increased intensity. From a position over New Jersey on the morning of the 14th it passed to northern New England by the following morning, and by the morning of the 16th was over the Canadian Maritime Provinces. A disturbance that was over the southern Plateau region for several days advanced by the morning of the 13th to the Texas coast, causing brisk to high winds over that region. By the following morning it had advanced to extreme northwestern Florida with increased intensity. Storm warnings were issued on the 14th for the south Atlantic coast, and on the 15th extended to Cape Cod. By the evening of that date the storm was central near Cape Hatteras, and by the following morning had passed northeastward

off the middle Atlantic coast, causing gales over the Atlantic seaboard from Cape Cod to Jacksonville. By the morning of the 18th the disturbance was over Newfoundland, with a pressure reading at St. Johns of 28.90 inches. Attending the advance of this storm temperatures rose, and precipitation was quite general in Gulf and Atlantic States.

The following weekly forecast was issued Sunday, February 18:

The distribution of atmospheric pressure as shown by the weather map of the Northern Hemisphere is such as to indicate a continuation of moderate temperatures throughout the country during the coming week, although it is probable that colder weather will appear in the northwest the latter part of the week.

The next general storm to cross the country will prevail in the North Pacific States Tuesday and Wednesday, the Middle West about Thursday, and the Eastern States Friday; the precipitation attending this disturbance will be mostly rain, although snow is likely in northern States east of the Rocky Mountains.

Stormy weather is indicated for the North Atlantic steamship routes east of the Grand Banks the coming week.

A disturbance that was central over the southern Plateau on the evening of the 14th, moved to New Mexico by the following morning with increased intensity. By the morning of the 16th it was over eastern Texas and rains had begun in the West Gulf States. Another low was central over Saskatchewan. By the morning of the 17th the southern low had advanced to the East Gulf States, causing rains in that region, while the northern low had passed to eastern Manitoba. On the following morning the southern low was near Hatteras with increased intensity and the northern one was over western Lake Superior. The low that was near Hatteras on the 18th passed northeastward over the ocean and the northern low was central over the Province of Ontario by the morning of the 19th. By the following morning it was over the St. Lawrence and by the morning of the 20th had passed to the Canadian Maritime Provinces. Precipitation occurred in the northern tier of States from Wisconsin to the Atlantic coast. High winds occurred on the East Gulf coast during the 20th and 21st, on the South Atlantic coast during the 21st and 22d, and on the North Atlantic coast on the 22d and 23d. Warnings of these winds were issued previous to their occurrence. No marked reaction to high temperatures accompanied this disturbance, except over New England during the 19th. The next disturbance of importance developed over the southern slope of the Rocky Mountains during the 19th and by the following morning was over Texas, having caused precipitation over New Mexico, Oklahoma, Kansas, northern Texas, Arkansas, Missouri, Tennessee, and northern Mississippi. Heavy snows were reported in southern Kansas and northern Texas. The disturbance increased rapidly in intensity and moved to Kentucky during the next 24 hours. During the afternoon of the 21st a tornado occurred at Shreveport, La., causing the death of eight persons, and another tornado near Liberty Chapel, Miss., caused the death of a number of others, besides damage to buildings. On the morning of the 22d the storm was over the St. Lawrence Valley with lowest reported barometer reading 28.62 inches at Quebec. During the next 24 hours it passed to the Grand Banks. In the Gulf States considerable damage was done to buildings and cattle. The gales along the Atlantic seaboard were severe, and in cities along the coast from Hatteras to Boston trees, signs, wires, etc., were torn down, and a number of wrecks occurred. A maximum wind velocity of 96 miles from the southwest was reported at New York City during the night of the 21st. Mariners and others interested were fully warned regarding the winds. In this connection, the following clippings are of interest:

Extract from the Gazette-Times of Pittsburgh, Pa., dated February 24:

* * * A striking illustration of the important part played by the Government Weather Bureau was furnished by the warnings issued in connection with the recent severe storm along the Atlantic coast. Shipping interests were advised in ample time that high winds of almost hurricane proportions were on the way. In many cases small vessels remained in port until after the danger was past. Ships at sea were warned by wireless and were able to prepare for the big blow. It is impossible to estimate the protection to life and property afforded by this up-to-date, efficient service. The instance mentioned was of a rather unusual and even spectacular nature, but every day in the year the Weather Bureau from headquarters at Washington and through its employees throughout the country is making careful observations, receiving and exchanging reports and issuing bulletins and warnings to shippers of perishable goods, railroads and marine interests, and others directly concerned with impending changes in meteorological conditions.

The following editorial is from the Evening Bulletin of Philadelphia, Pa., dated February 22:

The value of the Government weather service as a preserver of life and property has been particularly illustrated within the past 36 hours. Southeast storm warnings were set flying along the South Atlantic coast and northeast warnings along the North Atlantic coast Tuesday night. What are known in shipping circles as "big blows" were predicted, and the predictions, according to dispatches, have been amply verified. Numerous vessels in Atlantic ports have escaped danger either by delaying sailing from ports or by making preparations, after receipt of wireless warnings, to ward off possible disaster. Simultaneous with these warnings to skippers, the Weather Bureau has also been issuing bulletins on dangers from floods on the larger rivers, warnings of value to residents and property owners in lowlands. It is in these two branches that the service is of most avail, although the public is usually inclined to estimate its worth by the daily forecasts only.

The following is taken from the Journal of Commerce of New York City, dated February 24:

* * * New England shipping was so thoroughly warned on Wednesday that no small craft was caught on a lee shore, while full-powered steamers had plenty of time to seek shelter under the land. * * *

The New York Times published the following under date of February 23:

* * * Much comment as this giant among gales is receiving, strangely few people have anything to say about the timely warning we had of its approach and the exactness with which its course was predicted. It was early on Tuesday that the Weather Bureau notified the East of what was coming, and Wednesday morning, though then ordinary students of "signs" could see nothing indicative of conditions worse than "unsettled," the official prophets told us precisely where the cyclone was and what it was going to do. The triumph was, indeed, a simple and easy one, resting entirely on reports from the West and South, and the storm suffered none of the deflections and disturbances from other storms that so often occur, but the prediction was a very pretty piece of work, nevertheless, and it ought to make people hesitate just a little before repeating hereafter that stupid witticism—"the Weather Bureau is always wrong." Of course it is not always, or even often wrong, and the only basis for the prevailing distrust is that its occasional failures—or seeming failures—are remembered and resented, while its innumerable successes are ignored or forgotten.

This storm caused thunderstorms and rains in southern and snows in middle and northern districts from the ninety-fifth meridian to the Atlantic coast. It was preceded by temperatures above normal and followed by decided changes to colder weather. Heavy falls of snow were reported over Illinois, Indiana, Ohio, and lower Michigan. Following the passage of the storm just mentioned a high pressure area developed during the night of the 21st, and by the morning of the 22d was over the middle Gulf coast, causing heavy to killing frosts along the east Gulf coast. By the following morning it was over South Carolina, and frost was reported in northern Florida, being destructive to vegetation in the extreme northwest portion. By the morning of the 24th it was off the middle Atlantic coast. Decided falls in temperature preceded and attended this high in its passage across the Gulf States. From the 24th to 26th

a moderate area of high pressure passed from Saskatchewan to northern Ontario and thence disappeared into Canada, having caused changes to colder weather in Minnesota, North Dakota, and Michigan.

The following weekly forecast was issued Sunday, February 25:

A disturbance central Sunday in the Southwest will advance north-eastward to the Ohio Valley Monday and move thence to the St. Lawrence Valley; it will be attended by general precipitation over the Mississippi Valley and the region east thereof, the precipitation being in the form of rain in Southern and snow and rain in Northern States. This disturbance will be followed by a change to considerably colder weather over all districts east of the Rocky Mountains, but it will be of short duration, and it is probable that rising temperature will overspread the Plains States Tuesday and the eastern half of the country by the middle of the week. The next general disturbance to cross the country will appear in the far West Wednesday or Thursday, cross the middle West about Friday and the Eastern States near the close of the week; it will in all probability be attended by general rains, although snows are likely in Northern States.

Generally fair weather with moderate temperature will prevail during the week on the Pacific slope, with the exception that rains will set in over the North Pacific States Tuesday or Wednesday.

A low that was central over Utah on the morning of the 23d caused brisk to high winds during the next 36 hours on the southern California coast, warnings of which were issued on the 23d. The storm passed to the southern Plateau region by the morning of the 24th, and an area of precipitation spread eastward to the Mississippi Valley over Middle and Southern States. By the morning of the 25th it had passed to Texas and the area of precipitation had advanced eastward to the Atlantic coast and as far north as Virginia and the southern Ohio Valley. Warnings for brisk to high winds were ordered for the Gulf coast and occurred as forecast. The storm moved northeastward with rapidly decreasing pressure and by the morning of the 26th was over southern Illinois, precipitation having been reported over the entire country from the Plains States eastward, with the exception of New England. A tornado occurred on the afternoon of the 26th over southern Arkansas in the counties of Lincoln, Jefferson, and Arkansas, causing considerable damage and the death of 10 persons, and another tornado occurred near Mayfield, Ky. By the morning of the 27th the Illinois storm was central near Cape Cod, Mass., with lowest reported barometer reading 29.14 inches at Nantucket. Gales were reported from Jacksonville northward, warnings having been previously issued. By the morning of the 28th it had advanced to Nova Scotia with decreased intensity and during the next 24 hours had passed to the Grand Banks. Heavy snows occurred from the middle slope of the Rocky Mountains and northern Texas eastward and northeastward to lower Michigan, warnings of which were distributed to interested persons. Heavy rains were reported in the Ohio Valley, and the Middle Atlantic and New England States. This storm was attended by a reaction to high temperatures. A high of slight intensity passed across the Gulf States from the evening of the 26th to the evening of the 28th, and heavy frost was reported along the east Gulf coast and light frost in northern Florida. On the 27th one of the worst fogs in years occurred on the middle Atlantic coast from Cape Henry to Hatteras. On the morning of the 28th a high pressure area appeared over Alberta, accompanied by temperatures below zero, and by the following morning was over the Plains States. On that evening it extended from northern Missouri to Saskatchewan, there being two centers, one over the former and the other over the latter region. At the close of the month pressure was low over California, but no precipitation was reported along the Pacific coast.